IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	:	09/751,934	Confirmation No.: 8042
Applicant	:	James Neal Richter et al.	
Filed	:	December 29, 2000	
Group Art Unit	:	2161	
Examiner	:	Susan Y Chen	
Title	:	Automated Adaptive Classification	
	:	System For Knowledge Networks	
	:		
Docket No.	:	55564.080303	
Customer No.	:	27526	

Via EFS-Web
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

In response to the Final Office Action mailed January 20, 2006, to which a response is due June 20, 2006, with the petition for a two-month-extension submitted herewith, entry of the accompanying Request for Continued Examination and the following Preliminary Amendment is respectfully requested.

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this document.

Remarks/Arguments begin on page 8 of this document.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently Amended) A computer-implemented mapping method of classifying a plurality of informational items in an information retrieval without forming a probabilistic predictive model system, the method[[ ]] comprising the steps of:

detecting an access of a first informational item;

detecting an access of a second informational item;

establishing that a relationship link exists between said first informational item and said second informational item;

determining an ~~interger-value~~ integer-value weight based on the historical frequency of said relationship link; ~~and~~

applying an ensemble of ~~clustering~~ algorithms ~~directly proportional~~ to said first and second informational items relative to said integer-value weight of said relationship link; and [[.]]

assigning said integer-value weight to the output of said ensemble of algorithms.

2.   (Previously Presented) The method as recited in claim 1 wherein said step of detecting the second informational item includes the detecting of a plurality of informational items.

3.   (Canceled)

4. (Previously Presented) The method as recited in claim 2, further comprising the step of:

applying an algorithm for data aging wherein the usage of the relationship link is monitored and used as feed back for the integer-value weight associated with the relationship link.

5. (Previously presented) The method as recited in claim 4, further comprising the step of:

applying a pruning algorithm wherein external information regarding the usefulness of at least one relationship link is utilized to modify the integer-value_weight or existence of a recorded relationship link.

6. (Previously Presented) The method as recited in claim 5, wherein said pruning algorithm performs the removal of irrelevant relationship links subsequent to the data aging feedback process.

7. (Original) The method as recited in claim 5, wherein said pruning algorithm makes use of a user determined feedback of the usefulness of a relationship link.

8. (Currently Amended) The method as recited in claim 2, wherein said ensemble includes a plurality of algorithms and wherein said relationship link integer-value weight is ~~weighted~~ adjusted in direct proportion to the number of algorithms within said ensemble of algorithms that determine the existence of said relationship link.

9.   (Original) The method as recited in claim 2, wherein said relationship link is positioned in a list in direct proportion to the degree of consensus among said ensemble of algorithms.

10.   (Original) The method as recited in claim 2, wherein said ensemble includes a plurality of algorithms and wherein each algorithm within said ensemble of algorithms runs independently of all other algorithms.

11.   (Original) The method as recited in claim 2, further comprising the step of merging the outputs of said ensemble of algorithms.

12.   (Previously Presented) The method as recited in claim 2, further comprising the step of recording said relationship link in a non-Bayesian-type network.

13.   (Canceled)

14.   (Currently Amended) An apparatus for providing classification of informational items in an information retrieval system without forming a probabilistic predictive model comprising:

            means for detecting the access of informational items;

            means for applying an ensemble of ~~clustering~~ algorithms to the accessed informational items;

            means for establishing the existence of relationship links between said informational items to enhance the effectiveness of said information retrieval system; and

            means for weighting said relationship links, said weight being directly proportional to the outcome of said ensemble of algorithms.

15.   (Previously Presented) The apparatus of claim 14 including:

means for aging said relationship links; and

means for pruning said relationship links.

16.   (Currently Amended) The apparatus of claim 15 including means for merging the resulting output of said ensemble of algorithms into a ~~non probabilistic~~ knowledge network.

17.   (Original) A computer readable storage medium having stored thereon a computer program for implementing a method of classifying a plurality of information items in an information retrieval system, said computer program comprising a set of instructions for implementing the steps recited in claim 2.

18.   (Currently Amended) The computer readable storage medium according to claim 17, wherein said computer program further comprises one or more instructions for clustering the resulting output of said ensemble of algorithms into a ~~non probabilistic~~ knowledge network.

19.   (Original) The computer readable storage medium according to claim 17, wherein said computer program further comprises one or more instructions for improving the usefulness of said relationship links through weighting of said relationship links.

20.   (Original) The computer readable storage medium according to claim 17, wherein said computer program further comprises one or more instructions for improving the usefulness of said relationship links through pruning of said relationship links.

21.   (Original) The computer readable storage medium according to claim 17, wherein said computer program further comprises one or more instructions for improving the usefulness of said relationship links through aging of said relationship links.

22.   (Original) The computer readable storage medium according to claim 17, wherein said computer program further comprises one or more instructions for improving the usefulness of said relationship links through weighting, pruning and aging of said relationship links.

23.   (Cancelled)

24.   (Cancelled)

25.   (Cancelled)

26.   (Cancelled)

27.   (Previously Presented) The method as recited in claim 4, wherein said algorithm for data aging runs as a function of traffic load to age the relationship links according to relevance of the relationship links.

28.   (Currently Amended) A computer-implemented mapping method of classifying a plurality of informational items in an information retrieval system without forming a probabilistic predictive, the method [[_]]comprising the steps of:

       detecting an access of a first informational item;

       detecting an access of a second informational item;

       establishing that a relationship link exists between said first informational item and said second informational item;

determining an integer-value ~~interger-value~~ weight based on the historical frequency of said relationship link; ~~and~~

applying an ensemble of clustering algorithms directly proportional to said integer-value weight of said relationship link; and

combining and merging the output of said ensemble of clustering algorithms to pre-populate the informational retrieval system wherein the informational retrieval system may be a Baysean or a non-Baysean system.

REMARKS/ARGUMENTS

Responsive to the Final Office Action dated January 20, 2006, Applicants have filed a Request for Continued Examination and this Preliminary Amendment in which claims 1, 8, 14, 16, 18, and 28 have been amended. Claims 23 – 25 have been cancelled. Claims 1, 2, 4-12, 14-22, 27, and 28 are pending for prosecution. Claims 1, 14, and 28 are independent.

Claim 28 was amended to correct minor typographical errors and was not amended for any reason substantially related to patentability.

I.   Preservation of the Prosecution Record Regarding the Disclosure of A Non-Probabilistic Network

The following remarks are made with all due respect to the Examiner and are included merely to preserve the prosecution record. Applicants respectfully submit that the novel and inventive teachings described in the instant application are sufficiently detailed as to enable one of skill in the art to practice the inventive method of applying an ensemble of algorithms to a relationship link and merging those results into a non-probabilistic network. Applicants also respectfully submit that the description of the extensive modifications made to a Bayesian-**type** network according to the present invention are sufficient to be understood by one of skill in the art as describing a non-probabilistic network.

II.   The § 112 First Paragraph Rejection

Claims 16 and 18 stand rejected under 35 U.S.C. § 112 first paragraph "as failing to comply with the written description requirement." Claims 16 and 18 have been amended. In light of these amendments and for at least the following reasons, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 16 and 18 have been amended by replacing the term "non-probabilistic network" with the term "knowledge network." It will be appreciated that "knowledge network" is described and supported throughout the specification including numbered paragraph 0043 which states:

> [0043] This usefulness checking and control mechanism is implemented by means of a data aging and pruning feedback process 305. The method of using feedback that results in data aging enhances the efficiency and effectiveness of the current invention. In general, the data- aging step involves an algorithm that runs as a function of traffic load to age relationship links according to their relevance. The purpose of this process is to keep the **knowledge network** current. [Emphasis added]

Applicants respectfully submit that the amendments to claims 16 and 18 have obviated the basis for the present rejection. Applicants therefore request withdrawal of this rejection.

III.   The § 112 Second Paragraph Rejection

Claims 1-2, 4-12, 14-22 and 27 stand rejected under 35 U.S.C. § 112 second paragraph "as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." Claims 1, 8, 14, 16, and 18 have been amended. Amended claims 1 and 14 are independent. Claims 2, 4-12, 18-22, and 27 depend from amended independent claim 1. Claims 15 and 16 depend from amended independent claim 14. In light of these amendments and in view of the following remarks, Applicants respectfully request reconsideration and withdrawal of this rejection.

(a)   **Amended Claim 1**

Amended claim 1 provides a computer-implemented mapping method of classifying a

plurality of informational items in an information retrieval system without forming a

probabilistic predictive model. Claim 1 recites:

> detecting an access of a first informational item;
>
> detecting an access of a second informational item;
>
> establishing that a relationship link exists between said first
> informational item and said second informational item;
>
> determining an integer-value weight based on the historical
> frequency of said relationship link;
>
> applying an ensemble of algorithms to said first and second
> informational items relative to said integer-value weight of said
> relationship link; and
>
> assigning said integer-value weight to the output of said ensemble
> of algorithms.

It should be noted that amended claim 1 does not recite "clustering algorithms" thus, the

basis for the inquiry regarding "what are the claimed clustering algorithms?" found on page 4 of

the Office Action is moot. It will be appreciated, however, that the specification provides several

examples of algorithms that may be used in performing the steps recited in claim 1. For

example, the Abstract of the invention discusses use of "text classification algorithms," though

any algorithm for detecting a relationship between a first and second informational item may be

used.

The steps recited by amended claim 1 are fully described throughout the specification

including in FIG 4A and in numbered paragraphs 0045 through 0050. For example, according to

paragraph 0046, "a cluster of algorithms is applied to determine if a relationship between the two

or more informational items can be found." Paragraph 0048 provides that for "any relationships

were found in the previous step . . . a strength is assigned to the relationship link 406."

Further descriptions and support for the steps recited in amended claim 1 can be found throughout the specification including numbered paragraph 0042 which states "[t]he merging of the algorithm outputs in step 303, initially serves the purpose of allowing a certain weight or strength value to be associated with a particular relationship link . . . [t]he **weight or strength assigned to a particular link is directly proportional to the total number of individual algorithms at step 302A-302D that determine the existence of a relationship link between individual informational items. . ."** [Emphasis added]

The above referenced portions of the written description clearly demonstrate that the steps recited in amended claim 1 are fully supported by the specification. Thus, for at least the aforementioned reasons Applicants respectfully request reconsideration and withdrawal of the instant rejection to amended claim 1. Additionally, it is requested that the rejection to claims 2, 4-12, 17-22, and 27 be withdrawn as these claims depend from amended claim 1 and are also fully described and supported by the specification.

(b)   Amended Claim 14

The Office Action of January 2006 did not provide any basis for rejecting claim 14 under 35 U.S.C. § 112 second paragraph. The language of claim 14 differs from that of claim 1. Accordingly, a close reading of the statements set forth in the Office Action regarding 35 U.S.C. § 112 second paragraph clearly shows that such statements are not applicable to claim 14.

Amended Claim 14 is directed to an apparatus for providing classification of informational items in an information retrieval system also without forming a probabilistic predictive model. Amended claim 14 recites:

> means for detecting the access of informational items;
> means for applying an ensemble of algorithms to the accessed
> informational items;

means for establishing the existence of relationship links between said informational items to enhance the effectiveness of said information retrieval system; and

means for weighting said relationship links, said weight being directly proportional to the outcome of said ensemble of algorithms.

Page 4 of the Office Action states:
As to claim 1, it is unclear what "applying an ensemble of clustering algorithms directly proportional to said integer-value weight of said relationship link" refer to [i.e., what are the claimed clustering algorithms? Who applies the claimed ensemble of clustering algorithms? What is meant by "directly proportional to said integer-value weight of said relationship link"?

As previously mentioned, the language of claim 14 differs from that of claim 1. For example, as can be clearly appreciated by the language of claim 14, the step or feature of (means for) "applying an ensemble of clustering algorithms directly proportional to said integer-value weight of said relationship link" is **not** recited by claim 14. Thus, the above quoted statements regarding claim 1 and "claimed clustering algorithms" are not applicable to claim 14. As such, the aforementioned Office Action statements do not provide any basis for the rejection of claim 14 under 35 U.S.C. § 112 second paragraph.

The elements recited by amended claim 14 are fully supported and described throughout the specification, thus there is no basis for a § 112 second paragraph rejection. See generally numbered paragraphs 0034 through 0042 and 0045 through 0050 (and associated FIGs). For at least the aforementioned reasons, Applicants respectfully request withdrawal of the rejection to amended claim 14. Claims 15 and 16 depend from amended claim 14 and are fully supported by the specification as well. Thus, the withdrawal of the rejection of claims 15 and 16 is requested as well.

For at least the aforementioned reasons Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112 second paragraph of claims 1-2, 4-12, 14-22, and 27.

IV.   The § 103 Rejection over Horvitz et al in view of Wical

Claims 1-2, 4-12, 14, 15, 17, 19-22, 27, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Horvitz et. al (U.S. Patent No. 6,182,133) in view of Wical (U.S. Patent No. 5,904,821). Claims 1, 8, 14, and 28 have been amended. Claims 1, 14, and 28 are independent. In view of these amendments and for at least the following reasons, Applicants respectfully request reconsideration and withdrawal of this rejection.

The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. *MPEP §2142.* To establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, to modify the references or to combine reference teachings. Second, there must be reasonable expectation of success. Finally, the prior art must teach all the claim limitations. *MPEP §2142.* The teaching or suggestion to make the claim combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Applicants respectfully submit that a prima facie case of obviousness can not be established because both Horvitz and Wical, individually and in combination, fail to teach or suggest the claimed invention.

The Horvitz Reference

The Horvitz reference discloses a system that "harnesses available computer resources during periods of low processing activity and low network activity, such as idle time, for

prefetching, e.g., **web pages**, or pre-selected portions thereof, into local cache of a client

computer." [See Horvitz abstract, emphasis added].   According to the Horvitz system, a user

enters a website address URL (Uniform Resource Locator) into a web browser which loads the

web page associated with the first URL (Horvitz somewhat interchangeably uses URL, hotlink,

link, hyperlink, and hypertext link). The user then clicks on a hyperlink/hotlink of another web

page or website contained somewhere on the first web page. In an effort to minimize web page

load times the Horvitz system predictably prefetches web pages that the user **may** want to visit

next in the background by tracking the URL addresses entered or selected by the user (via

hotlinks). The tracked URL's and hotlinks are given a "transition probability" which Horvitz

describes in column 24, line 50 – column 25, line 10 as:

> This model specifies for a given web page, in terms of its URL, a
> set of successive web pages (one or more and in terms of their
> URLs) to which the user is likely to next transition, i.e., visit next,
> and for each such page a numeric probability (hereinafter a
> "transition" probability) that the user will select that **particular**
> **page**. For a given user, this model is probabilistic in nature, such
> as, e.g., a Bayesian network or a special class of general
> probabilistic models, such as a Hidden Markov model, which
> encodes past preferences of that user in terms of conditional
> probabilities of transitioning to a given URL given the page (s)he
> is presently viewing. This set and the transition probability
> associated with each **URL** therein are collectively supplied, as
> symbolized by line 615, to page transition predictor 630. **The**
> **predictor, given these probabilities, ranks the URLs in the set**
> **and then supplies these URLs, rank ordered in descending**
> **order of their transition probabilities, to URL retrieval**
> **component and data receiver 650.** [Emphasis added]

It should be clearly understood that Horvitz specifies that his "techniques" and

"teachings" uses a "user" model. See Column 3, lines 42-47.

> **"My inventive technique satisfies this need for prefetching and caching web**
> **pages (or, generally speaking, information), as determined by a user model, that**
> **may be selected in the future by the user or that contain content that may be of**

interest to the user based upon current and/or, e.g., prior interaction of the user with, e.g., his (her) client computer."

Also see column 4, line 63 –column 5, line 8.

"In accordance with these inventive teachings, a browser, through use of., e.g., a probabilistic user model, can compare rate of refinement in utility provided by a current information download, i.e., a web page currently being fetched, and compare that rate against a discounted flux-product associated with a web page to which the user is likely to transition in the future (i.e., a "future" web page). Whenever the discounted flux-product of the latter page exceeds the rate of refinement with time then being provided by continuing to download the former page computational or networking resources are deallocated from the current information download and allocated (applied) to prefetching and storing the future web page."

Thus, Horvitz describes a system that requires a user model and states that such a user model is probabilistic.

The Wical Reference

The Wical reference discloses a knowledge base search and retrieval system, which includes factual knowledge base queries and concept knowledge base queries. Wical discloses the concept of a distance weight which, in one embodiment, associations have distance weights ranging from 1-10. See col. 12, lines 44-55.

Remarks

Applicant's amended claims specifically call for a method/system that is functionally operable "without forming a probabilistic predictive model". As has been pointed out above, and in previous responses, applicant's method/system does not use probabilities or conditional probabilities. It does not form user models. Nor does it make predictions. To the contrary, applicant's invention functions by detecting access to informational items and establishing relatedness strengths by using integer-value weight through comparing document similarity in the manner described and claimed.

With respect, it is completely inappropriate to try and combine the teachings of Horvitz with the teachings of the Wical reference. In short, Horvitz is clearly a predictive system based on counting clicks whereas the Wical teachings are more information centric. It will be appreciated by one of skill in the art that the transition probability of the Horvitz reference is clearly not compatible with the assignment of the distance weight teachings of the Wical reference.

Assuming arguendo, that it were possible to combine the Horvitz reference with the Wical reference, such combination still fails to render claims 1, 14, and 28 obvious. Furthermore, even if the Wical reference does disclose an information retrieval system with weights expressed in integers, as stated on Page 5 of the Office Action, the basis for the obviousness assertion based on the combination fails because the Horvitz reference fails to provide, disclose, teach, or suggest all of the missing claim steps/elements.

Of the numerous differences between the claimed invention and the Horvitz reference an exemplary difference is one of focus in that Horvitz system is squarely directed to tracking the **address of a web page** as opposed to **content** as recited in the "informational items" of claims 1, 14 and 28. Another exemplary difference is one of granularity in that the URL / address is the only unit that is examined in the Horvitz system whereas a benefit of the "informational items" recited in claims 1, 14, and 28 is that it is possible to address units of variable granularity.

The Horvitz reference arguably discloses informational items, however, Horvitz does not disclose, suggest or teach the steps of "**detecting an access** of a first informational item" and "**detecting an access** of a second informational item." It is well known in the art that a URL is the **address** of a **resource** on the internet. The Horvitz system tracks URLs and likely tracks access to URLs. A URL is **not an informational item** as recited in the claims. The Horvitz

system does not track access of informational items. Accordingly, the Horvitz system does not detect access to information items as recited by claims 1, 14 and 28.

The Horvitz reference fails to disclose, teach or suggest the "relationship link" recited in claims 1, 14 and 28. It is well known in the art that "a hotlink specifies an address of an associated page" however, Applicants respectfully disagree with the statement on page 4 of the Office Action in which it is suggested that a hotlink is a "relationship link", "[e.g., the link relationship between Web pages at col. 1 lines 53-59]." While the Horvitz reference discloses use and tracking of hotlinks, the reference does not disclose, teach or suggest establishing hotlinks or establishing the existence of hotlinks and/or adding them to web pages. Furthermore, Horvitz does not disclose, teach or suggest the step of associating web pages and creating hotlinks such as called for in the subject claims.

Instead, the Horvitz reference clearly describes use of a system whereby selected hotlinks (which are **already present** in a loaded web page) are tracked. The Horvitz reference does not disclose or suggest the step of associating web pages and **creating a hotlink or adding a hotlink to a webpage** in response to monitoring a user clicking on hotlinks or entering URLs. Even assuming *arguendo*, that the URL/hotlink/hypertext of the Horvitz system was an informational item, the hotlink is pre-existing and the Horvitz reference does not disclose, teach or suggest the step of "establishing that a relationship link exists between said first informational item and said second informational item" as recited in claim 1.

Accordingly the Horvitz reference fails to disclose, teach or suggest the element of "means for establishing the existence of relationship links between said informational items to enhance the effectiveness of said information retrieval system" as recited in claim 14. It will further be appreciated that by extension, the Horvitz reference fails to disclose, teach or suggest

the step of "establishing that a relationship link exists between said first informational item and said second informational item" as recited in claim 28.

The "rank ordering" using server log data of the Horvitz reference for providing a list of URLs of the most frequently visited web pages on a server does not teach, suggest or disclose the step of "determining an integer-value weight based on the historical frequency of said relationship link" as recited by claim 1. Applicants respectfully disagree with page 5 of the Office Action which implies that the aforementioned claim step is disclosed in the Horvitz reference in stating "determining a weight for the relationship link, said weight proportional to the historical frequency of the selection of the combination of informational items [e.g., the simple rank ordering of URLs of Web pages at col. 4, lines 20-47]." Instead, Horvitz describes tracking URLs in logs as follows:

> For a given user, the user **model** can be, e.g., **a simple rank ordering of URLs based on log data of page transitions** across all individuals who visit a given web site containing those pages or a Bayesian **model** of the preferences of that user encoded in terms of, e.g., numeric conditional probabilities, of selecting, e.g., given a displayed page, other pages. This **model** can reside in a web server, a client or across both.

At most, (and assuming for the sake of discussion that a URL is an information item) the above quoted text merely discloses a simple rank ordering of individual information items. The Horvitz reference does not disclose, teach or suggest performing any operation on relationship links, much less determining an integer value weight. It will be appreciated by one of skill in the art that adding a URL to a history log (on the browser) or adding a URL to a server access log does not describe, suggest or teach the step of "determining an integer-value weight based on the historical frequency of said relationship link" as recited in claim 1.

Accordingly the Horvitz reference fails to disclose, teach or suggest the element of "means for weighting said relationship links, said weight being directly proportional to the outcome of said ensemble of algorithms" as recited in claim 14. It will further be appreciated that by extension, the Horvitz reference fails to disclose, teach or suggest the step of "determining an integer-value weight based on the historical frequency of said relationship link" as recited in claim 28.

Finally, the Horvitz reference does not disclose, suggest, or teach the step of "applying an ensemble of algorithms to said first and second informational items in direct proportion to said integer-value weight of said relationship link" as recited by claim 1 because the Horvitz reference does not disclose, suggest, or teach a "relationship link" for the reasons already discussed. Additionally, it will be appreciated that without a relationship link, it is not possible to "determining an integer-value weight" for same. Accordingly the Horvitz reference fails to disclose, teach or suggest the step of "applying an ensemble of clustering algorithms directly proportional to said integer-value weight of said relationship link" as recited in claim 28.

For at least the aforementioned reasons Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 103 of claims 1, 14, and 28. Claims 2, 4-12 depend from claim 1 and are allowable for at least the same reasons. Claims 15, 17, 19-22, and 27 depend from claim 14 and are allowable for at least the same reasons. Therefore, Applicants respectfully request withdrawal of the standing rejections.
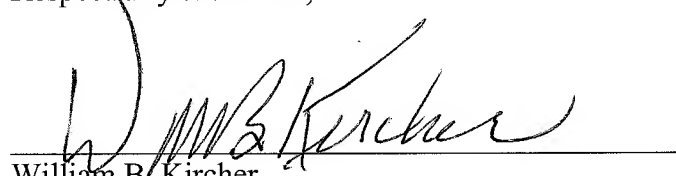
Conclusion

Applicants respectfully submit the claims are in condition for formal allowance which is courteously solicited. If any issue regarding the allowability of any of the pending claims in the present application could be readily resolved, or if other action could be taken to further advance this application such as an Examiner's amendment, or if the Examiner should have any questions regarding the present amendment, it is respectfully requested that the Examiner please telephone Applicants' undersigned attorney in this regard. The Examiner's attention is also drawn to the proper correspondence address shown below. Should any fees be necessitated by this response, the Commissioner is hereby authorized to deduct such fees from Deposit Account No. 11-0160.

Respectfully submitted,

Date: 6/20/2006

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